

Controversies and Translation in Public Statistics¹

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Public statistics is a small item in the sociologists of science' research agenda, and the sociology of science and technology is practically an unknown approach for statisticians, particularly for those involved in the production and development of public statistics. In this text, I intend to bring together these two fields - the sociology of science and public statistics - under the assumption that both can benefit from this approximation. My empirical references will be drawn from the experience of Brazil's Statistical Office (Fundação Instituto Brasileiro de Geografia e Estatística, IBGE), but I hope the subject can have a wider interest. Since readers may be familiar with one field, but not with the other, a brief introduction to each is necessary.

Public Statistics

"Public statistics," or "official statistics," refer to the statistical information produced by government statistical agencies - census offices, statistical bureaus and similar institutions. They are of special interest to the sociologist of science because they are developed in institutions which are, simultaneously, research centers - pertaining, therefore, to the scientific and technological values, perspectives and approaches typical to their fields of enquiry - and public, or official institutions, bound by the rules, values and constraints of the public service. Their products - figures related to income, national product, urbanization, employment, human fertility, and many others - are published in the press, used to support government policies and evaluate its outcomes, and can lead to legal and financial entitlements to specific groups. This plurality of roles, contexts and perspectives associated with public statistics is at the very origin of the field.

Alain Desrosières, who has written extensively on the subject, shows how modern statistics emerged from at least two major traditions, one from Germany, another from England. The German tradition is essentially descriptive, taxonomic, and concerned with providing the government with the necessary information to run its state. The association between these two terms, "state" and "statistics," is not fortuitous. The birth of German statistics is thus summarized by Desrosières:

Elle propose au Prince ou au fonctionnaire responsable un cadre d'organisation de savoirs multiformes disponibles sur un État, c'est à-dire une *nomenclature* dotée d'une logique d'inspiration aristotélicienne. Cette forme a été codifiée, vers 1660, par Cornring (1606-1681). Elle a été transmise ensuite, tout au long du XVIII^e siècle, par l'université de Gottingen et son "école statistique", notamment par Achenwall (1719-1772), réputé comme le créateur du mot "statistique", puis par son successeur à la chaire de statistique, Schlözer (1735-1809). Celui-ci, auteur d'un "*Traité de Statistique*" traduit en français en 1804 par Donnant (ce qui fera connaître ce mode de pensée allemand dans la France du début du XIX^e siècle) a été le premier de ce courant à recommander l'usage de chiffres précis plutôt que d'indications exprimés en

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termes littéraires, sans pour autant le faire beaucoup lui même. Une formule de Schlözer est significative de la tournure plutôt structuraliste et synchronique de la statistique allemande: "La statistique est de l'histoire immobile, l'histoire est de la statistique en marche."³

Desrosières links the British tradition, known in the past as "political arithmetics," to the relatively smaller place of the State in that country, regarding other social groups and institutions. These groups and institutions needed precise indicators for specific goals, and developed methods for sampling and indirect estimations, bringing statistics close to mathematics. The English statisticians, he says,

"Ce ne sont pas des universitaires théoriciens qui édifient une description globale et logique de l'État en général, mais des gens d'origines diverses qui ont forgé des savoirs pratiques dans leurs activités y que les proposent au "gouvernement." [. . .] Ainsi s'esquisse un rôle social nouveau: l'expert à la compétence précise qui propose de techniques aux gouvernants, en essayant de les convaincre que, pour réaliser leurs desseins, ils doivent en passer par lui. Ils offrent un langage précisément articulé, alors que les statisticiens allemands, s'identifiant à l'État, proposent un langage général englobant."⁴

This brief reference to the birth of statistics is enough to show the links that existed between statistical methods and approaches and the social conditions of their emergence, and this is precisely the approach of the sociology of science. Before going further, let us take a closer look at this approach (sociologists of science would prefer to jump to the next session at this point), and explain my view on a very sensitive issue related to it, that of the "objectivity" of "scientific facts."

Sociology of Science

Sociology of science has its roots in Karl Marx and Émile Durkheim, who proposed, in different ways, that man's concepts and interpretations of reality were to be understood in terms of the way society is organized⁵. These proposals seemed to be relatively easy to apply to the social sciences, but did not lead to much in the natural and exact sciences⁶. In the forties and fifties Robert K. Merton, and later Joseph Ben-David, developed what became known as the "externalist" approach to the sociology of science: it was the sociologist's task to study the conditions for the emergence of scientific research, the ways scientists organized their work, the measurement of their activities and production, their sources of support, and so on, without ever daring, however, to establish causal links between these external factors and the contents of the scientists' work, which was supposed to follow their internal logic of intellectual advancement and truth seeking.

³ Desrosières, Alain, *La politique des grands nombres: histoire de la raison statistique*. Paris, Éditions la Découverte, 1993, p. 30; Hecht, J., "L'idée de dénombrement jusqu'à la révolution", in *Pour une histoire de la statistique*, tome 1, 1977 (réédité en 1987), Economica, Paris, INSEE, p. 21-81. 1993., 1977 (quoted by Desrosières).

⁴ Desrosières, p. 36.

⁵ For a comprehensive and extremely readable intellectual history of the sociology of science, see Merton, Robert K., "The Sociology of Science: an Episodic Memoir", in Robert K. Merton and Jerry Gaston, *The Sociology of Science in Europe*. Carbondale and Edwardsville: Southern Illinois University Press, 1977, 3-144..

⁶ The failures of Engels' *Dialectics of Nature* and Lenin's *Materialism and Empiro-criticism* led the Marxist philosopher Giorgi Lukacs to propose a sharp distinction between the sciences of nature and the science of man, and excluded the former from the onslaught of contextual interpretation. Engels, Friedrich, *Dialectics of nature*, translated and edited by Clemens Dutt, with a preface and notes by J.B.S. Haldane, London, Lawrence and Wishart, 1941. Lenin, Vladimir Ilich, *Materialism and empiro-criticism; critical comments on a reactionary philosophy*, Moscow, Foreign Languages Pub. House, 1952; Lukacs, Gyorgy, *History and class consciousness; studies in Marxist dialectics*. Translated by Rodney Livingstone. Cambridge, Mass., MIT, Press 1971.

Today, the field is associated with the names of Barry Barnes, David Bloor, Michel Callon, Harry Collins, David Edge, Karin Knorr, Bruno Latour, Steve Woolgar and others, which developed what became known as the "strong program" in the sociology of science⁷. The aim is to put down the fences built by Merton to protect the scientists' work from the sociologist, bringing sociological analysis to the very core of the processes of knowledge formation. Earlier founders include Alexander Koyré and Ludwik Flek, but the field derives more directly from Thomas S. Khun's classical text on *The Structure of Scientific Revolutions* and Michael Polanyi's *Personal Knowledge*. For Khun as for Polanyi, scientific knowledge does not exist on itself, embodied (or, rather, disembodied) in books, articles and mathematical equations, but in the consensus of groups of individuals, or scientific communities. A large part of this consensus is implicit, and therefore not subject to rational demonstration or refutation. Knowledge does not grow and change through successive approximations to "truth," but through paradigm shifts which entail profound reorganization in the way science is conceived and structured as a human endeavor, in interaction with nature. Observing scientists in their laboratories like anthropologists observe Indians in their tribes, sociologists of science could document the painful and tortuous procedures by which scientific facts are "manufactured"⁸ in laboratories and introduced in the specialized literature.

The storm created by these views is still ravaging around the issue of relativism, relativists on one side, universalists on the other. Are the sociologists really saying that there is no way of telling truth from falsehood, science from prejudice? An extreme interpretation of the findings of modern sociology of science is indeed that scientific knowledge is completely relative, being nothing but the expression of power of specific groups, disguised in obscure language and pretense objectivity. It would be the role of the social analyst to bring into the open what is hidden; research findings should be debunked (or "deconstructed") through contextual, ideological or linguistic interpretations. The symmetrical reaction, on the scientist's camp, is equally harsh. For them, sociologists and historians of science do not understand what science is about: empirical evidence, rationality, demonstration, truth. Truth is a matter of rationality and demonstration, and therefore not contingent on the scientist's social context, cultural values, ideologies and preferences. On one side, scientific knowledge, common sense, superstition and even sheer "error," are said to be the same thing; on the other, the demarcation lines separating "scientific knowledge" from the rest are absolute.

Not surprisingly, I take a middle ground in this debate. Rather than trying to spell it out, let me quote approvingly from Bruno Latour:

Whereas universalists declare that this common yardstick [of truth] does exist, absolute relativists are delighted that there is no such thing. Their attitudes may differ, but both groups agree in asserting that the reference to some absolute yardstick is essential to their dispute. This amounts to not taking the practice of relativism, or even the word relativism, very seriously. To establish relations; to render them commensurable; to regulate measurement instruments; to institute metrological chains; to draw up dictionaries of correspondences; to discuss the comparability of norms and standards; to extend calibrated networks; to set up and negotiate valorimeters - these are some meanings of the word "relativism." Absolute relativism, like its enemy brother absolutism, forgets that measurement instruments have to be set up. By ignoring the work of instrumentation, by conflating science with nature, one can no longer understand anything about the notion of commensurability itself. They neglect even more thoroughly the enormous efforts Westerners have made to "take the measure" of other peoples, to 'size them up' by rendering them commensurable

⁷ The seminal text is probably Bloor, David, *Knowledge and Social Imagery*, London, Routledge & Kegan Paul, 1976.

⁸ The expression comes from one of the earlier and more influential texts in the field, Karin-Knorr's *The Manufacture of Knowledge: An Essay on the Constructivist and Contextual Nature of Science*. (Oxford and London: Pergamon Press, 1981).

and by creating measuring standards that did not exist before - via military and scientific expeditions.⁹

One of the more interesting insights of the sociology of science is that what is usually known and understood by "science" and "technology" is just one segment of much larger networks of people, institutions, instruments, hardware and nature itself. For any kind of scientific concept, instrument, artifact or product, it is possible to identify a network of actors associated with it. A personal computer (one of the examples elaborated by Latour) links academic physicists and mathematicians, engineers, hardware and software producers, patent offices, standards committees, marketing agencies, shops, technical assistant networks and users of all kinds; and it depends on the physical properties and availability of semiconductors and a wide array of raw materials. People at one end of the chain usually do not understand what others are doing at the other, which means that there is a constant work of translation going on between adjacent actors. Application producers have to understand the possibilities and limitations of operational systems, which depend on hardware, which depends on the physical properties of the materials that can be delivered by industry. In the other direction, users have to understand the language of programmers (who, in turn, strive to translate their devices in terms of natural languages), and vendors have to anticipate the needs of buyers. Once in place, these chains affect the way work is organized in offices and companies, influence the curricula of schools, and introduce changes in the labor market. These chains are never created linearly, either from top down (a conceptual theory leading to an experimental model, leading to a tested product, leading to further development and marketing, and so forth) or from bottom up (a consumer demand leading to a product, leading to research, leading to new concepts and theory). Innovation may take place in all links anytime, and dead ends and brilliant failures are common throughout. At the end, to paraphrase Bruno Latour, it is not necessarily the best product, theory or technology that gets established; rather, it is the product, theory or technology that gets established that becomes the best, not only because it is the "winner," but because it will benefit from increasing investments from all parts concerned. One of the most striking features of modern society is the establishment of such networks, which is not necessarily a peaceful and harmless procedure, as witnessed by the expansion of western science and technology to the rest of the world. Nevertheless, once established, these networks lead to increasing benefits to all participants, forging alliances that seem to grow without limits and barriers.

Knowledge networks and alliances in public statistics

A similar picture of networks, translations and alliances can be used to describe a well established statistical procedure carried on by a public statistical agency. Take the cost of living indexes, used almost everywhere to measure inflation, to set income policies and to evaluate the prospects of a given economy. For the economist, prices are linked to a series of concepts such as investment, consumption, saving patterns, exchange rates, productivity, interest rates. Several of these concepts are used by governments in their efforts to control and direct the economy, and for private actors to make decisions about investment, consumption and employment. Trade unions use cost of living indexes to set targets for their negotiations, and political parties use them to mount campaigns in favor or against governments. For the press, cost of living indexes can be a hot topic for their readers, particularly if they can be easily interpreted in terms of their private expectations and the image of the performance of public authorities.

Going in the opposite direction of the chain, the economist's concepts are translated by statisticians in a series of procedures to measure variations in the index. They include the identification of items and sectors that are to be monitored (consumption goods, durable goods, capital goods, services); their relative weight, based on consumption patterns of specific groups (workers, middle class, poorer segments); and their distribution in the

⁹ Latour, Bruno, *We Have Never Been Modern* (Cambridge, Harvard University Press, 1994), p. 112-113.

geographic space. Samples of informers, regions and products are to be established, accepted limits of error are defined, and permanent mechanisms for data collection and processing are put in place. These two last tasks go beyond the realm of the statistician's work, and include other actors in the process. Data can be collected by specialized firms, temporary workers or permanent staff, which establish their own routines for getting into the field and bringing in the data. Information processing is handled by computer specialists that make decisions about the equipment to be used, the appropriated software and the timing for data processing and delivery.

Similar descriptions could be made about other types of indicators, such as employment, poverty levels, crop forecast, industrial production, international trade, migration patterns, population growth, national income and income distribution¹⁰. To keep the analogy with the personal computer, all actors would have problems if they had to contend with different and incompatible products - IBM PCS, Macintosh and Amiga - or three different indexes of employment and inflation and two different values of per-capita income. Whenever a technological chain reaches the size of mass consumption markets, the tendency is for one product or industrial standard to prevail, while the others either disappear or find special niches of users and applications.

Standardization, credibility and translation strategies in public statistics

This logic of standardization explains the uneasiness created whenever competing figures or information are presented to describe or quantify presumably identical "realities." International statistical institutions, such as the United Nations Statistical Commission, Eurostat and other regional bodies spend most of their efforts trying to establish standards to unify and make compatible data produced by different countries. National statistical agencies want to have their data accepted within their countries and in the international community, and react whenever competing figures or indicators are presented by other national institutions or international organizations. Newspapers complain and talk about "confusion" whenever different figures appear. Governments, of course, are not happy when the figures they use to set their targets and evaluate their achievements are placed against competing and diverging information. Conceptual and empirical standardization is always a very complicated, costly and uncertain process. The irony of it is that, at the end of the day, all parts involved are committed to the notion that they are talking about the same "reality" which was already there from the beginning making it very hard to explain why it cost so much to get there.

One would expect from this confluence of interests that public statistics would naturally evolve toward unification along well established standards, leaving little space for controversies and disputes. This is not so simple, however, since, whenever a sequence of procedures gets established, others are rejected, and their stakeholders are not pleased. There are many reasons for resisting standardization. On its simplest form, it is just a matter of who will get the resources or the contracts to do the job. If the figures produced by one institution are adopted by everybody, this institution will get the resources and support to continue its work, while others will wither away. But the consequences can be much wider, since, for instance, different estimations of income distribution could lead to different policies of investment and resource allocation from governments. The reasons why such conflicts do not linger forever are the same that explain why other social conflicts eventually get settled: on the long run, the collective gains of stabilized systems tend to be higher than the private benefits gained through protracted conflicts. Statistical concepts and technical devices play

¹⁰ A very interesting analysis of the development of professional classifications in the French, German, British and American statistical offices can be found in Alain Desrosières, "How to make things which hold together: social science, statistics and the state", in P. Wagner, Björn Wittrock and R. Whitley, eds., *Discourses on Society*, Amsterdam: Kluwer Academic Publishers, 1990, 195-218.

important roles in this process of stabilization of social interaction, a "moral role" which is not apparent from their deceptively simple technicalities¹¹.

Michel Callon suggests the following scheme for the constitution of a "sociology of translation," which could be used to understand how this coordination of different actors speaking different languages and hold different values can be brought together¹². The first step in his scheme is "problematization, or how to get indispensable." An essential element in this first stage is the "definition of obligatory passage points." If I want to develop a new survey on technological innovation, for instance, all interested parties should be convinced that, if they want to incorporate modern technology in their activities, they would have to get the proper data to measure and evaluate it, and my institution or research group is the best one for doing this work. The second step is "interessement," a very complicated and unpredictable process of convincing all potential actors that they have a common interest, to be fostered in this specific way. To use Callon's words, "for all groups involved, the interessement helps to corner the entities to be enrolled. In addition, it attempts to interrupt all potential competing associations and to construct a system of alliances. Social structures comprising both social and natural entities are shaped and consolidated."¹³ The third step is "enrolment," how to get all actors to behave in compatible ways. In our example, I must convince the companies to respond to the questionnaires, to convince the government to provide the necessary resources, and the policy makers to consider this information in their future investment decisions. The fourth step is "the mobilization of allies." All actors must agree that the research institute is their spokesman, that the data produced expresses the common realities and interests of all parts involved.

A crucial component in this process is, therefore, the reputation, prestige and legitimacy of the researchers, or the research institute. Ivan Fellegi, Canada's Chief Statistician, insists in a recent paper that "the core values of effective statistical systems are legitimacy and credibility"¹⁴.

Authoritarian governments can define what the official figures should be, but the question is whether anyone would believe them (one is reminded of the 99% of votes always obtained by official candidates in elections in the Soviet Union). Credibility, thus, is an essential component for the acceptance and adoption of uniform standards and procedures. But what are the origins of credibility, from where does it come?

A credible information is one that comes out from a credible institution, and may not be rigged in favor of a specific interest group or ideology (Fellegi refers, in the above mentioned paper, to "non-political objectivity").. Institutional credibility is very much a matter of political culture. Public institutions in Germany or France are supposed to be credible, while similar institutions in the United States or Brazil can never take their credibility for granted.

The second source of credibility is technical and scientific. Information is accepted as credible if they are provided by people or institutions with a strong scientific and technical profile. A third source of credibility is stability and consistency. Figures produced always through the same procedures are easier to be accepted than figures that vary depending on

¹¹ This observation comes from Bruno Latour's "Le fardeau moral d'un porte-clefs", in Latour, *La Clef de Berlin et autres leçons d'un amateur de sciences* (Paris, La Découverte, 1993, 47-55), and other related texts in that volume.

¹² Michel Callon, "Some elements of a sociology of translation: domestication of the scallops and the fishermen of St. Brieuc Bay", in John Law, editor, *Power, Action and Belief - a new sociology of knowledge?*, London, Routledge & Kegan Paul, 1986, 196-233.

¹³ Callon, p. 211.

¹⁴ Fellegi, Ivan P., "Characteristics of an Effective Statistical System", *International Statistical Review* 64, 2, 1996, pp. 165-197, followed by comments by Katherine K. Wallman, Chief Statistician, U. S. Office of Management and Budget, and others. It is clear, from Mrs. Wallman's comments, that the statistical institutions in the United States do not enjoy the same degree of legitimacy as their Canadian counterpart.

shifting methodologies, concepts and procedures¹⁵. Thirdly, institutions organized to defend the interests of specific groups are less credible than those supposed to be independent, at least for other sectors of society. A research center financed by the tobacco industry will have difficulties gaining acceptance for their findings showing that secondary smoking is harmless. Research institutions associated with trade unions will have a hard time convincing others that their figures for unemployment and cost of living are the best. To gain credibility, they should try to disentangle themselves from their supporting sectors, and raise their scientific and technical credentials.

Scientific reputation and scientific disciplines: the establishment of IBGE

Scientific reputation is therefore a central ingredient of conceptual stability and credibility. This is a curious paradox, because, contrary to popular belief, empirical sciences are dominated by provisional, tentative, probabilistic and even contradictory findings and controversies, and not by hard-rock logic, evidence and demonstration. Examples are everywhere, from the recent "mad cow" controversy in England to the endless discussions about global warming, and the harmful effects of drug usage or cigarette smoking. In the social sciences, there is no preestablished and consensual methodology for measuring social stratification, social mobility or for predicting population growth. This does not mean that "anything goes": some population predictions work better than others, and there is a real problem with the "mad cow" disease, although we do not know precisely its extent. What makes "science" hard and solid is not "science" in itself (if we mean by the term just what takes place within the scientific communities) but the decisions taken by different actors to adopt a set of procedures and build the chain of activities, products and interests associated with them. At the end of the day, the "scientific" ingredient is a minor part of the whole process, and less important, sometimes, than others. In fact, scientific innovations often lead to deep changes in established procedures and associated interests, which, as we know since Thomas Khun, take more than simple rational demonstration to get accepted and adopted.

Another complicating factor is that the production of statistics is not limited to a single academic discipline, that of the statistician. The agenda of public statistical offices is set by a combination of government requests, social demands, concepts developed by economists, demographers and social scientists, and methodologies developed and tested by statisticians. International agencies, such as the United Nations Statistical Offices, the United Nations regional and specialized offices, Eurostat, the World Bank, the International Labor Organization and similar institutions play a very important role of setting the agenda, establishing standards for comparability and providing statistical offices throughout the world with technical training. In spite of this constant pressure toward standardization, a survey of current practices will probably show a wide range of variation in the way statistical offices respond to the demands of their different clients and professional communities¹⁶.

The Brazilian Institute for Geography and Statistics - IBGE - was created in the 1930s as one element in an ambitious attempt to organize a modern and authoritarian state which could know and rule upon a vast and unknown territory and a scattered population. The ideologies of the time assumed that the central government should draw its strength from the country's grassroots, the municipalities, bypassing the traditional state oligarchies. At the

¹⁵ There is an obvious parallel here with two of Max Weber's sources of political legitimacy, rationality and tradition. One could speculate about the possible role of the third one, charisma, in this context.

¹⁶ There is a growing literature on the development of contemporary statistical practices, but little, it seems, in terms of systematic comparisons among countries. Extensive bibliographic references on early and contemporary historical developments are given by Alain Desrosières in his publications. For a flavor, see Bulmer, Martin, Kevin Bales, and Kathryn Kish Sklar, *The Social survey in historical perspective, 1880-1940*, Cambridge University Press, 1991; Fourquet, François, *Les Comptes de la puissance : histoire de la comptabilité nationale et du plan racontés par Claude Alphandéry*. Paris, Encre (Recherches), 1980; INSEE, *Pour une histoire de la statistique*, tome I (1977) et tome 2 (1987), Paris, INSEE; Wagner, Peter, Björn Wittrock and Richard Whitley. *Discourses on society : the shaping of the social science disciplines*. Dordrecht ; Boston : Kluwer Academic Publishers, 1991.

beginning, the goal was to coordinate the statistical work carried on by the municipalities throughout the country, and the German inspiration was explicitly acknowledged by its founder, José Bulhões de Carvalho. A National Council of Statistics (Conselho Nacional de Estatística) was formally established in 1936, followed by a National Council of Geography (Conselho Nacional de Geografia) in 1937. In 1942, however, as Brazil joined the Allies in World War II, a very tight system of economic and administrative centralization was established in the country, under U. S. inspiration, and the statistical and geographical institutions followed suit - the local statistical and geographical entities were abolished, and absorbed into a national bureaucracy which remained for the decades to come ¹⁷.

Geography was probably more important, in the early years, than statistics itself, for the fulfillment of this task. The more direct influence came from French geographers, which had also a strong presence in the establishment of Brazil's first universities at the time,

17 Penha, Eli Alves, *A Criação do IBGE no contexto da centralização política do Estado Novo*. Rio de Janeiro: IBGE, Centro de Documentação e Disseminação de Informações, 1993. A very preliminary list of historical references available at IBGE's library include also: Alves, Marilda Dias. *O Desenvolvimento do sistema estatístico nacional*. Rio de Janeiro: IBGE, 1988; Backheuser, Everardo, *Problemas do Brasil: (estrutura geopolítica: o "espaço")*. Rio de Janeiro, Grupo Editor Omnia, 1933; Backheuser, Everardo, *A estrutura política do Brasil*. Rio de Janeiro: Mendonça Machado, 1926; Brandi, Paulo Moretzsohn. *Cartografia, problema de base nacional*. Rio de Janeiro: [s.n.], 1970; Carneiro, Júlio A. Barboza. *Relatório apresentado ao Dr. Geminiano Lyra Castro. Assunto: Instituto Internacional de Estatística (18. Sessão: Varsóvia, 1029. Rio de Janeiro: Typ. da Estatística, 1929; Carneiro, Júlio A. 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Rio de Janeiro: IBGE, 1963.

but again, the geopolitical thinking derived from German authors was strong. The introduction of the 1940 census, the first one done by the Institute, was a lengthy and ambitious book called *The Brazilian Culture*, written by Fernando de Azevedo, a sociologist of education which was influential in the creation of the Universidade de São Paulo, and who edited, some years later, the first comprehensive survey of Brazil's scientific institutions and groups.¹⁸ It was the geographer's task to depict the land, define its borders and identify the available resources for the construction of a powerful nation state; it was the task of the sociologist and educator to identify the cultural elements that were turning the country into a modern, Western-type society.

In the sixties and seventies economics took precedence over geography. The Institute was placed under a new Ministry of Planning, which included also the National Research Council and the National Development Bank, and its main task was redefined as to be the provider of basic information for the country's economic development plans. Besides the usual demographic information and mapping, the institute became responsible for organizing the national accounts, and its centerpiece was to be an ambitious input-output matrix allowing for the identification of bottlenecks and evaluation of the potential impact of investments in energy, transportation, steel production, petrochemicals and other inputs in the country's economic fabric. France, again, may have provided the intellectual and organizational model - not the geographers any longer, but the economists at INSEE, perhaps in combination with technical assistance coming from the United Nations (and particularly the Latin American Statistical Commission - ECLAC). A whole new generation of economists was recruited and charged with redrawing the Institute's research strategy, under the assumption that all information should fit together in a comprehensive economic model.

Writing in 1972, IBGE's President Isaac Kerstenetzky presented his view of how the country's planning system had to be organized, and the role the statistical office was supposed to play in this grand scheme:

A teoria da política, contida nos modelos de tipo sinótico ou de decisão, apresenta (...) uma seqüência inversa à da análise econômica convencional. (...) Identificamos, em primeiro lugar, alguns objetivos que consideramos desejáveis e indagamos, em seguida, o que deve ser feito de modo a manipular os vários meios (instrumentos) à nossa disposição no sentido de alcançar os objetivos desejados"¹⁹.

And later:

"O conjunto de atividades da área de estatística e pesquisa sócio-econômica reuniria e sistematizaria dados e realizaria estudos capazes de permitir a construção de modelos com os aspectos mais salientes da estrutura sócio-econômica do país. Estes modelos permitiriam a identificação de trajetórias alternativas de desenvolvimento. A esfera política, em função da avaliação dos grandes objetivos sociais, estabeleceria um plano de ação segundo a trajetória escolhida." (Underlines in the original)²⁰.

¹⁸ Azevedo, Fernando de, *Brazilian culture; an introduction to the study of culture in Brazil*. Translated by William Rex Crawford. New York, Hafner Pub. Co., 1971; and Azevedo, Fernando de (editor), *As Ciências no Brasil*, São Paulo, Editora Melhoramentos, 2 volumes, 1955.

¹⁹ "The policy theory implicit in the synoptic, or decisional model, follows a sequence which is the inverse of the one used by conventional economic analysis. First, we identify some goals we consider desirable; second, we look for what should be done in order to manipulate the instruments we have at our disposal to reach our goals".

²⁰ "The set of activities in the field of statistics and socioeconomic research would bring together and organize data and carry on studies needed to construct models with the more salient aspects of the country's socioeconomic structure. These models would allow for the identification of alternative development paths. The political sector, based on an evaluation of the main social objectives, would establish a plan according to the chosen path. Kerstenetzky, Isaac, *A Estatística no Planejamento*, Presidência da República, Estado Maior das Forças Armadas, Escola Superior de Guerra, doc. C33-123-72, 1972.

The association between geography, statistics and economic planning was not difficult to justify, at least in principle²¹: planning was not to be done by simple manipulation of macroeconomic variables, but by direct intervention in the country's physical and economic landscape. Less easy was to link this whole project with the awareness that Brazil's modernization project was leaving a large part of its population at its margins, and was affecting society in unpredictable ways. Neither geography nor economics provided good answers to these questions, and a group of social anthropologists was brought in to develop a system of social indicators which would, hopefully, be integrated with the global model for economic planning, rendering it more humanitarian and socially aware²².

In practice, the Brazilian economy was never run through the Ministry of Planning²³, and it is doubtful that the data produced by the Statistical Office were ever used systematically by governments for their long range planning, except in very general terms. But the planning imagery had deep consequences for the internal organization of the office. Now each research line could be said to have a definite place in a coherent picture, and could not be easily challenged or changed. As long as the planning imagery retained its appeal, the office's legitimacy would remain intact. When, years later, the office went through a difficult period of lack of resources and loss of prestige, the usual interpretation for the crisis among its technicians was that it was a consequence of the governments' loss of its planning capabilities. Today, the office's organization and research agenda is still very much that of those times, and it is difficult to reconcile it with the current skepticism about government planning and comprehensive modeling.

Statistics itself however, as a discipline, does not seem to have ever been a central intellectual component of the Institute's technical and professional make up²⁴. In an attempt to follow the French tradition of government controlled "grandes écoles," the Brazilian census office created its own National School of Statistical Sciences (ENCE), which was supposed to become its main source for professional recruitment. Although the school still exists, it never fulfilled this role, for several reasons. The Institute never succeeded in assuring employment to ENCE's graduates²⁵; as an isolated establishment, it was not able to keep abreast with the scientific and intellectual developments in the field, and lost place to other courses and degree programs in universities; and, above all, statisticians did not seem to have the knowledge and skills associated with the prevailing planning imagery.

It would be interesting to examine how far this Brazilian experience was unique, or similar to what happened in other countries. As other subject matters enter the agenda of statistical offices - issues like employment, education, health, agriculture, environment conditions, social and political participation, race, language, social discrimination - the professional profile of statisticians also changes. Other professional identities - that of the economists, of course, but also sociologists, educators, environment and health specialists - may be stronger in many statistical agencies than that of the statistician. This proposition should be verified empirically, since users of data are not necessarily trained and interested in

21 In practice, there were problems, sometimes severe, as in the early fifties, when the whole statistical system organized by Teixeira de Freitas came under threat by a newly designated Institute's president, a military man associated with the field of cartography (Djalma Polli, 1952, and Teixeira de Freitas, 1952).

22 In recent years there has been an effort to include environment issues in this grand scheme. The idea, put forward by international organizations and already being tried in several countries, is to develop national systems of "environment accounts", which could be linked with the national accounts, hopefully, with associated measurements of "human welfare", or human development.

23 Still today, the Ministry of Planning is responsible for the budgetary process, investments and long term, general planning, while the Ministry of Economics, though the Central Bank, handles the main economic variables, such as the exchange and interest rates and the control of government expenditures.

24 The Italian statistician Giorgio Mortara provided, for many years, the Institute's main intellectual and professional orientation in statistical matters. See IBGE, *Giorgio Mortara : publicação comemorativa do centenário de nascimento*. Rio de Janeiro, Fundação Instituto Brasileiro de Geografia e Estatística, 1985.

25 In the Brazilian civil service, only the military and the Foreign Service can guarantee employment for students of their educational institutions.

the chores of data gathering, processing and validation, which are typical of the daily work of statistical agencies. But, if true, it would be related to the fact that statistics today, as an academic subject, is essentially a specialized branch of mathematics, while statistical skills are an increasing component of the education in all social and economically related fields, and greatly simplified by ready-made software. In many countries, these separate specialties are associated with the multiplication of statistical institutions - the United States is probably the extreme, but not the only case. When statistical offices are unified - as in Brazil or Mexico, which include also geography under their umbrella - the consequence may be the development of internally differentiated technical cultures, more related to each academic field outside than with the other sectors within the institution.

To this fragmentation of academic disciplines one should add the widespread tendency of research centers and institutions to become much more pragmatic and goal-oriented than in the past. There is growing skepticism about comprehensive systems of social analysis and interpretation, which are associated with the demise of comprehensive planning as a tool of government policy; and the expansion of applied, goal-oriented and product-oriented research. An important element of this change is the breaking down of disciplinary barriers and the development of all kinds of interdisciplinary and interinstitutional cooperation and networking in all knowledge fields²⁶. These trends are related, in turn, to the growing pressures upon universities and research institutes to link more closely with industry and to relate to many other social groups besides the conventional students - to leave the ivory tower and to respond more pragmatically to short-term demands. For the statistical offices, this trend suggests a pressure to move from comprehensive statistics to service-oriented work, not only in terms of how data is to be distributed and disseminated, but even in terms of what data should be collected and processed.

Translations and controversies

We have argued, so far, that there is a tendency in the field of public statistics to look for unified and consistent figures and concepts which would be accepted by a wide range of actors, including social scientists of different disciplines, professional statisticians, bureaucrats in statistical offices, governments, legislators, interest groups, the press, political parties and international organizations. For each actor, the advantage of unified concepts and figures is that they can always argue that they are not just defending their own interest, but are relying on "objective" and "scientific" data that are beyond dispute. At the same time, of course, they would prefer to get the figures and concepts that are more convenient for their particular interests and professional cultures. In other words, the tendency toward unification is not without its tensions, since what is at stake is who, or what, will set the standards and control the process of data production and evaluation - Apple or IBM, in our computer analogy. Our further contention is that these tensions find their outlets and feeding grounds in the fissures and inconsistencies that take place in the translation process between different actors and milieux²⁷. What is natural and proper in the academy may be questionable and problematic in other contexts. Once published, public statistics gain a life on their own, which is not fully compatible with the way they are constructed. Sometimes they are translated into legally binding decisions; sometimes they are taken by the press, and translated to the general public in simplified terms. Sometimes they are taken by political parties and non-government organizations, which use them to justify their actions. Whenever concepts and expectations from one sector are used to evaluate what takes place in the other, tensions and

²⁶ For a summary of these trends, see Gibbons, Michael, and C. Limoges, H. Nowotny, S. Schwartzman, P. Scott and M. Trow, *The New Production of Knowledge - The Dynamics of Science and Research in Contemporary Societies*, London, Sage, 1995.

²⁷ Michel Callon talks about translation in the sense of transformation, of turning the actors into something else. "To translate is to displace". "Translation is the mechanism by which the social and natural worlds progressively take form. The result is a situation in which certain entities control others" (Callon, p. 223-224). I use the term here in a more conventional sense: to translate is to be able to communicate, however imperfectly, among cultures and languages that remain different.

misunderstandings are likely to occur. Still, since there is a tendency for each sector to look for its legitimation elsewhere, keeping them apart is impossible. The examples below, taken from the Brazilian experience of the last several years, illustrate that.

Translation I - from empirical research to legal entitlements

In Brazil salaries, rents and other prices have often been pegged to cost of living indexes, which cannot be defined in probabilistic terms. The way it is done, the president of the statistical office signs an official act each month announcing what the official inflation figure is. What differentiates this act from an arbitrary decree is the assumption that this figure was obtained through valid scientific procedures, which are open to anyone to inspect and replicate. The practice, however, is much more complicated. Although the general statistical procedures, weights and sampling techniques are public, details are kept confidential to protect the privacy of informers, and to protect the index from actual or presumed manipulation from outside. Statistical errors are usually not published, and the systems of data collection and processing, including the weights attributed to the different items in the consumers' basket, are kept stable for long periods²⁸. This situation is further complicated by the existence of several inflation indexes produced by different institutions and yielding slightly different results. These differences are not difficult to explain on technical grounds, but, particularly in times of high inflation, they are almost impossible to explain to the public. For the specialist, prices clearly do not rise and fall at the same time in the whole economy, and the existence of different institutions producing independent estimates of similar data can be seen as a positive trait of an open and democratic society. The legislator, however, needs just one figure to establish its policy, and can come under suspicion if he can choose, among several indicators, the one that suits him best.

Another example is related to population estimates. Yearly population figures provided by the statistical office are used by the Brazilian authorities to distribute part of the federal tax resources among municipalities (the so-called "Fundo de Participação dos Municípios"). Because of this legislation, the number of municipalities in Brazil increased about 50% in a few years, reaching a figure close to six thousand, and in each case the statistical office was asked to inform the population and the boundaries of the new jurisdiction. The reliability of the figures provided, however, depends on the quality of the previous population census (the last one in Brazil was in 1991) and on assumptions on migration patterns, fecundity and mortality rates derived from different studies. Statistical errors are unavoidable, and are likely to get bigger the smaller is the population group to which the projections refer. Besides, one of the main findings of Brazil's 1991 census was a dramatic reduction on fecundity rates in the previous decade, leading to a much smaller population, and lower projections for the 1990s, than was generally expected. Thousands of complaints and requests from municipalities for revision of population estimates flooded the statistical office. The Federal Accounting Office (Tribunal de Contas da União) decided to keep using the population estimates of the 1980's instead of those based on the 1991 census for the distribution of resources. In 1996 the statistical office obtained government support to do a mid-decade population enumeration to adjust the country's population estimates. The population specialists at the Institute believed that this was necessary on technical grounds, and the budgetary request got ample support in Congress, largely because of the municipalities' complaints. There is no assurance, however, that the new population estimates would be any more favorable to the municipalities than before.

Other examples could be taken from the institute's cartographic and geographic activities. Boundaries between countries, states and municipalities depend on detailed and precise maps, but, before that, on legally binding decisions, based on agreements, negotiations, litigation and even warfare among countries. Brazil has some history of armed border conflicts between states (the conflict between Minas Gerais and Espírito Santo lasted

²⁸ A survey on household consumption patterns is being done in Brazil in 1995-6 to replace the weighting system established through a similar survey in 1987, which is the one still in place.

for decades, with occasional shooting breaking out). If a conflict cannot be decided by force or negotiation, would it not be possible to get a "technical" solution to the problem, coming from the country's geographical institute? If one knew how to divide the open seas between the states of Paraná and Santa Catarina, facing each other in the Atlantic, one would know how much each should get in royalties from the oil being produced by Brazil's oil company, Petrobrás, in this area. Since there is no single technical solution to the problem (straight lines can be drawn based on different kinds of assumptions about an irregular shoreline), the Institute is under constant accusation from one part of being partial to the other, while it is impossible for the parts to get a binding decision from the Supreme Court.

The pattern in all these examples is similar. There are interests in conflict, and the statistical office is required to provide a technical solution. It is a request for arbitration, which is usually better for all parts involved than a protracted conflict. But arbiters are bound to decide in favor of one of the litigants, and therefore may have its authority challenged by the loser. To play this role, the arbiter has to convince the litigants that his moral, legal and technical virtues are beyond doubt and criticism. There is a constant process of translation going on - conflicts of interest being translated into technical questions, and technical and scientific processes being translated into legally binding decisions. As in any translation, communication between different languages and cultures is possible, but something is also lost in the process.

Translation II - from social concerns to statistical research

Professional sociologists and economists would expect that concepts, categorizations and procedures used in their research would come from social and economic theories in their fields. In practice, society places demands on the statistical office which are not only not derived from existing theoretical and conceptual models, but are often extremely difficult to conceptualize and measure in technically acceptable ways. Three outstanding examples are race, poverty and employment.

Should Brazilian statistics include figures on race? Brazil is a multiracial country (native Indians, Portuguese and Dutch colonizers, black African slaves, German, Italian, Central European, Jewish, Arab and Japanese immigrants in this century) with a large mixed-blood population. Racial discrimination is a criminal offence, but there is evidence that race (or color of the skin) is strongly related with all indicators of social mobility and well being. Social discrimination, even if not explicit, is common. Differently from the United States, however, the dividing line between whites and blacks is blurred. In the United States one is "black" if one of his parents (or even grand parents) is black; in Brazil different shades of blackness bring different social definitions, and it is very easy to "pass" from one race to another if one can associate a fair skin with some education and a reasonable income. The prevailing interpretation is that Brazil does not have a "racial question," but a large social question, and a high correlation between poverty and the color of one's skin, explained by the fairly recent history of black slavery. For some time, race was kept outside the census and the official statistics. First, because it would be impossible to have an "objective" racial classification for the population, given the high levels of miscegenation; and second, because the collection of figures on race could lead to the development of race cleavages that did not exist.

When the question about race was finally introduced in the 1980 census questionnaire, it was phrased in terms of "color of the skin," and the answers were classified into black (preto), white (branco), brown (pardo) and yellow (amarelo), the last one combining Japanese and Chinese descendants with Indian natives²⁹. Since it was a self-classification, it could only be interpreted culturally. The data confirmed that race or color of the skin had an independent effect on social conditions, but did not challenge the dominant view that race (or color) was

²⁹ This classification should be compared with the usual classification adopted in the United States between "White Anglo-Saxons", "Black", "American Indians" and "Spanish".

not a criterion to be used for social policy. More recently, however, there has been a demand from black militant groups to introduce policies of affirmative action similar to those adopted in the United States, a demand associated with the request to introduce race questions in all kinds of public documents, including the public registry for birth, marriage and deaths. The expectation is that, through these means, a racial classification will be introduced in Brazilian society, creating an entitlement for social and economic benefits. The argument is that this classification already exists, and is just not well portrayed by existing statistics; the opposite view is that the collection of these data will sharpen and shift the current social issues to other arenas, converting the current shifting racial self-classifications into sharply defined categories. On the long run, people may freeze their identities according to officially defined classification, race identification may be required in identity cards and even in arm bands, and sharp and scary race cleavages, which do not exist today, may materialize, in a self-fulfilling prophecy.

Poverty and employment, or unemployment, are similar concepts in popular perception, but very different issues both from historical and from the official statistics' point of view. Desrosières links the first statistical studies on poverty with 19th century England, and the emergence of unemployment statistics with the New Deal in the United States almost a century later³⁰. Poverty has been a constant presence in man's history, but its meaning has changed through time³¹. Most people in traditional societies were poor, and this was accepted as natural and unavoidable. Pauperism becomes an issue when the poor are displaced from their usual environment and life patterns and move out of their regions looking for food, shelter or work. Poverty was a constant source of concern and debate in England since the inception of the Industrial Revolution, most of the discussion being on whether the poor should be treated as victims, and therefore entitled to protection and support, or morally inept, to be left to their own fate. The second view was to prevail, not only among hard-core liberal economists, but for Marx himself, with his well-known contempt for the *lumpenproletariat*. Poverty became a moral issue, a question of character and good will, and not something related to the way society was organized.

If you did not work, but wanted to, you were not poor, but unemployed. Economic fluctuations created unemployment, and the 1929 crisis produced millions of unemployed in the United States and Europe. Different from poverty, unemployment was understood to be a by-product of modern industrial economy, and mechanisms had to be devised to reduce it, or compensate for its consequences. Everybody, in principle, should have a stable work in a modern economy, and action was needed when it did not happen. Anti-cyclic policies, on one hand, and unemployment compensation, on the other, were landmarks of the post 1929, Welfare State capitalism. Unemployment had to be measured, and proper statistics should be devised for that, but it should not be confounded with poverty. To be unemployed was an attribute of industrial workers, not of people outside the productive system - housewives, old people, beggars, the *lumpenproletariat*. The current standard statistical definition of unemployment, adopted and implemented by the International Labor Organization, measures precisely that. Unemployed are those who are without jobs, but are actively looking for one, or living from unemployment benefits. If you are not looking for a job, if you live from welfare, if you live from handouts from your family, if you beg in the streets, you are not unemployed, but simply outside the economically active population. Unemployment statistics became an excellent instrument for measuring the short-term fluctuations of economic activity, and the widespread use of similar methodologies allowed for meaningful international comparisons.

The assumption that everybody should have a stable job, however, is being questioned in industrialized countries, and never really existed in developing and underdeveloped

³⁰ "Chômage et inégalités: comment bâtir des objets nouveaux", pp. 244-257; "Le pauvres: comment les décrire, qu'en faire?", pp. 271-276; in Desrosières, 1993.

³¹ For an overview, see Castel, Robert, *Le métamorphoses de la question sociale - une chronique du salariat*, Paris, Fayard, 1995.

societies³². The concern that economic development was leaving large segments of the population at its margins led to the emergence of marginality, first³³, and poverty, more recently, as objects of social research and, gradually, to the establishment of regular statistical procedures in statistical offices. Statistics on poverty and on unemployment developed independently, and today in Brazil they are subject of two, quite separate controversies.

The unemployment controversy is centered on the existence of two regular, independent unemployment surveys. One, PME (*Pesquisa Mensal de Emprego*), is done by IBGE, and the other, PED (*Pesquisa de Emprego e Desemprego*), is carried on by the statistics office of the State of São Paulo, Fundação SEADE, in association with a research center maintained by the trade unions, DIEESE. The most evident aspect of the controversy is that PED figures are consistency higher than those of PME. Part of the difference is well explained on technical grounds: PME is centered on the concept of "open unemployment," while PED includes also "hidden unemployment." But even when this difference is eliminated in the analysis and comparisons are made for the same period of reference, there are still discrepancies, which may be attributed to the sequence in which the questions are presented to the respondent during field work, duration of the interviews and other technicalities. The technical differences between the two surveys do not seem unsurmountable, although this statement in itself may be controversial. Besides the final single figures, both surveys measure different types of unemployment (those looking for jobs in the last week, or in the last month, for instance). Both include information on the quality of the jobs held, distinguishing among stable employment (which in Brazil requires a formal contract and the payment of several taxes on social security) and different types of precarious work.

The Brazilian Ministry of Labor, which provides funds for the SEADE-DIEESE survey, established an expert group to analyze and try to reconcile the two surveys, with the expectation that a methodological unification could lead to economies of scale and an extension of the unemployment surveys to other parts of the country. A proposal for a joint methodology is still to appear at the time of this writing, and a public debate on the issue carried on at the recent National Conference of Statistics in Rio e Janeiro showed that the expectation created by this action is heating the debate still further.³⁴ The reason why a

³² Only the Communist regimes attempted to provide full employment for their population. This, however, was done in many cases through massive dislocation of whole segments of society, forced labor and even genocide, and led on the long run to economic stagnation and paralysis.

³³ "Marginalidad" was a central issue in Latin American social sciences in the late sixties and seventies, but did not seem to have penetrated the regions' statistical offices at the time. Some references include Acedo Mendoza, Carlos, *América Latina, Marginalidad y subdesarrollo*, Caracas: Fondo Editorial Común, 1974; Germani, Gino, *El concepto de marginalidad: significado, raíces históricas y cuestiones teóricas, con particular referencia a la marginalidad urbana*, Buenos Aires: Ediciones Nueva Visión, c1973; DESAL, *Marginalidad en América Latina; un ensayo de diagnóstico*. Santiago, DESAL, 1969 [c1967]; Margulis, Mario, *Migración y marginalidad en la sociedad argentina*, Buenos Aires, Paidós, 1968; Mattelart, Armand. [y] Manuel A. Garretón, *Integración nacional y marginalidad: un ensayo de regionalización social de Chile*, Santiago de Chile, Editorial del Pacifico, 1965; Núñ, José, Miguel Murmis [y] Juan Carlos Marín, *La marginalidad en América Latina; informe preliminar*, Buenos Aires: Instituto Torcuato di Tella, Centro de Investigaciones Sociales, 1968; Quijano, Aníbal, *Imperialismo y "marginalidad" en América Latina*, Lima: Mosca Azul Editores, 1977; United Nations. Economic Commission for Latin América, *Bibliografía sobre marginalidad social*, Santiago de Chile, La Biblioteca, 1973; Vekemans, Roger, Ismael Silva [y] Jorge Giusti, *La marginalidad en América Latina: un ensayo de conceptualización*, Santiago de Chile, Centro para el Desarrollo Económico y Social de América latina (DESAL), 1970; Yalour de Tobar, Margot Romano, María Magdalena Chirico [y] Edith Soubie, *Clase obrera, anomia y cambio social. El proceso de socialización urbana*, Buenos Aires: Instituto Torcuato di Tella, 1967.

³⁴ For a feeling of the controversy and the issues involved, see, among articles published in newspapers, Aluísio Mercadante, "Emprego!", *Folha de São Paulo*, February 4, 1996; "Taxas de Emprego vão de 6% a 16%", *Folha de São Paulo*, June 9, 1996; "Fernando Henrique diz que taxa de emprego recomeçou a crescer em abril - Presidente cita dados do IBGE, mas os números do DIEESE dão aumento de desemprego", *Jornal do Brasil*, June 15, 1996; André Urani, "Qual é a taxa de desemprego hoje no Brasil?", *Folha de São Paulo*, June 19, 1996, p. 2. See also the following papers, presented to the seminar "Desafios para Repensar o Trabalho", IV Conferência Nacional de Estatística, Rio de Janeiro, May 28, 1996: Ricardo Paes e Barros and others, *Em busca de um núcleo comum para as pesquisas domiciliares sobre emprego e desemprego no Brasil*; Cláudio Salvadori Dedeca, *Metodologia e Construção de indicadores de desempenho de um mercado de trabalho heterogêneo*; Martha Maria M. Mayer, *Comentários sobre os trabalhos elaborados para a mesa redonda*.

technical solution is not readily worked out to reconcile the two surveys is that there are many other layers in this controversy besides the technical one. Part of the discussion is precisely on whether the differences between the two surveys are just technical or have an underlying ideological or political content. The arena for the controversy changes completely if one accepts one or the other interpretation; or, conversely, one may wish to displace the controversy to the arena where one feels stronger. The fact that one survey is carried on by the Federal Government and the other by an institution linked to the trade unions may be used on both sides as an argument for the political hypothesis. And a unified methodology would lead to questions about who will receive or stop receiving resources for doing the survey, processing the information and publishing the results.

The controversy on poverty hinges around the question of how many paupers and indigents there are in Brazil: the figures may vary from eight to 64 million, for a total population of 157 million. A similar controversy exists about the number of destitute children living in the countries' streets, with figures varying from a few thousand to several million. Contrary to the unemployment controversy, there is just one main source of information for the controversy on poverty, the income figures from Brazil's 1991 census and the yearly national household sample surveys (PNAD) produced by IBGE. The differences in figures depend on where one draws the poverty line: one minimum wage? Two? Where would one place the dividing line between (acceptable?) poverty and (unacceptable) indigence?

This issue has an obvious public opinion appeal, and figures on absolute numbers of paupers, indigents and destitute children are eagerly sought after by the Brazilian national and international press. Marginality and poverty are morally charged issues, which are raised by religious groups, charitable foundations and, more recently, non-governmental and mission-oriented international organizations, which build their reputation on the strength of their condemnation of social ills. High poverty figures mean an overall condemnation of the society that produces them, and from this perspective the issues of employment and unemployment are minor or irrelevant. From another point of view, however, it would seem obvious that meaningful social policies of poverty alleviation would require detailed and well-differentiated information on the needs and conditions of specific groups, for which specific policies could be devised.

The translation of the poverty issue into internationally comparable statistical procedures, required by international agencies that have raised the social questions to the top of their agenda, has led to an almost impossible quest for an "objective" definition of absolute poverty³⁵. Declared income in a national survey or census is obviously inadequate, not only because of under-reporting, but because of unsurmountable problems of exchange rates and the different weights of non-monetary earnings in different regions and cultures. Nutrition and health conditions of the population are possible alternatives, but systematic information on these issues is difficult to get, and there are no consensual definitions of their meaning except for extreme conditions. Another possibility is to try to define a minimum basket of products considered essential for survival, and to use the access to this basket as the dividing line. Shifting consumption habits, shifting availability of staple products and, for international comparisons, fluctuating exchange rates makes these evaluations extremely unreliable and unstable.

These difficulties do not mean, of course, that the issues of poverty should be left aside. It is possible, and necessary, to measure and compare indicators of social inequality,

³⁵ For the current international perspective, see United Nations, Economic and Social Council, Working Group on International Statistical Programs and Coordination, *Social Statistics: Follow-up to the World Summit for Social Development (report of the Expert Group on the Statistical implications of Recent Major United Nations Conferences)*, United Nations, document E/CN.3/AC.1/1996/R.4, 24 January, 1996.; *Implementing the World Bank's strategy to reduce poverty: progress and challenges*, Washington, D.C.: World Bank, c1993. For Brazil, see Rocha, Sônia. *Estabelecimento e comparação de linhas de pobreza para o Brasil* Rio de Janeiro: IPEA, Instituto de Pesquisas, 1988; Rocha, Sônia, *Poverty in Brazil: basic parameters and empirical results*. Rio de Janeiro, Instituto de Pesquisa Econômica Aplicada, [1992?]. Ricardo Paes de Barros and others, "Modernidade e pobreza", in João Paulo dos Reis Velloso e Roberto Cavalcanti de Albuquerque, orgs, Fórum Nacional: *A construção da Modernidade Econômico-Social*. São Paulo, SP: Nobel, c1994.

and to develop precise instruments to evaluate how different population groups are facing the problems of social deprivation, and the policy alternatives that could be devised to support them. Overall figures mean very little, because they vary widely depending on shifting assumptions, and in any case encompass many different situations and social conditions. From the public opinion perspective, however, as reflected in the printed press and militant groups involved on the poverty issues, different figures are unacceptable demonstration of “statistical confusion,” “lack of clarity” or technocratic obfuscation³⁶.

Conclusion: the sociology of science and the future of public statistics

Sociology of science can do for public statistics the same service it can provide for science and technology in general: to show how knowledge production is organized in a particular field, the different actors that take part in their production, the complex translations, shifts of meaning, interpretation and responsibilities that take place, and the shifting alliances and conflicts that accompany this whole process. It is not its purpose take side in controversies, to take a stand for or against “science,” but to make explicit what is often implicit and not said, and, in this process, allow for a work that is useful and necessary, but should not be mystified. It may be a self defeating task. Whenever you make translations and shift responsibility from the political, legal and public opinion to the technical sphere, you start to reveal the uncertainties that exist also in the technical area. The first and typical reaction of the statistical office to this invasion of its technical realm is to stiffen its stand: “this is the correct figure, we do it scientifically, we are legally empowered to do it, stand by our reputation and tradition, our technical procedures are too complex (or confidential) for you to see and understand.” This reaction may limit the office's ability to improve its methodology and open for criticism, innovations and new approaches; but it can be successful, since it reduces ambiguity. The opposite reaction is to be more candid, to recognize the limitations and implicit choices present in all kinds of statistical and cartographic procedures, and to insist that it is impossible to provide technical solutions to conflicts of interest which cannot be accommodated. This kind of reaction is more in tune with the ethos of academic research and the usual patterns of intellectual honesty, but runs the risk of not being well received, and may be translated, simply, in the idea that the institute lacks competence to provide proper and unquestionable information on economic realities and social needs³⁷.

There is no coming back, however, from the second alternative. The dividing lines between producers and users of knowledge are breaking up almost everywhere, not in the sense that “science” is becoming accessible to everybody (which it is not), but in two other important senses. First, producers of knowledge are being evaluated more closely by the worthiness of the products they provide, and have to strive to get their products at the consumer’s hands. It is not enough to produce complex statistics to be published in lengthy

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37 René Padiou provides the following list of contrasts between legal and statistical concepts from his experience at INSEE, showing how the issue is general: “legal status of business companies versus economic nature or organizational feature; officially married versus concubines ; fiscal rules for stocks evaluation and equipment devaluation versus economic `fix capital consumption`, toll and tariff classifications versus technical or economical ones; town administrative border versus agglomeration limit, etc” (René Padiou, personal communication). Peter Wagner has suggested a more systematic distinction between the two kinds of languages, the statistical and the legal ones: “In the first case, statistics is, so to say, on the ‘soft’ side, collecting data from the diffuse social reality, and it is another social ‘language’, the one of law, which makes them ‘hard’, creates real boundaries where there have been ‘only’ statistical classifications. In the second case, in contrast, the move is from the ‘soft’ observation of social problems towards statistics as a ‘hardener’, a tool to get a grip on something fixed and identifiable. If you agree with this observation, it might be useful to reverse the order: to go from, first, the desire to ‘hold things together’ which turns to statistics as a methodology, to (which in some cases may really be a second policy step) the case where statistical classifications are translated into rights and obligations. And one could try to think of examples where the process is reversed (or threatens to be reversed): When legal entitlements are abolished, figures lose their meaning and the social world returns to diffuseness.” (Peter Wagner, personal communication).

volumes full of tables or interpreted in esoteric journals; it is necessary for the knowledge producers to travel through the whole chain of translations from data production to product dissemination, making sure that the translations are reliable and credible. Second, thanks in large part to the new computational and information facilities available to the informed user, he is much more able to revise and reorganize the information he receives for his personal use than in the past. To respond to this demand, the statistical offices must be able to travel also in the opposite direction in the translation process, from products to production, making more open and explicit the technical and methodological choices that are part of the daily life of any research institution. Combined, these two tendencies can make the life of the public statistics institutions more difficult than in the past, but perhaps also more challenging and interesting.